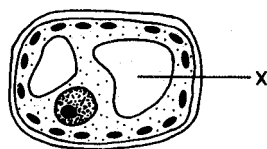


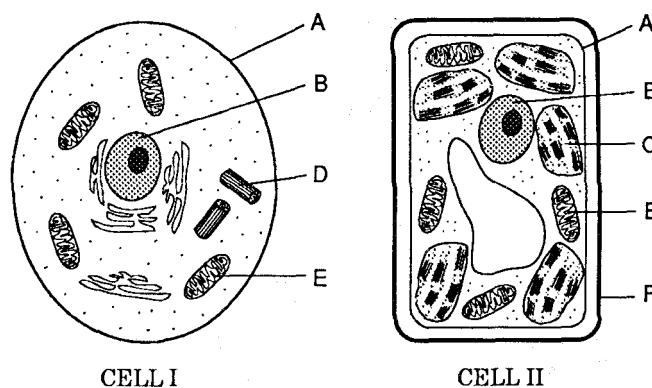
Liv Enviro Midterm Review

1. Which life process is classified as autotrophic in some organisms and heterotrophic in other organisms?
(1) hormonal regulation
(2) nutrition
(3) anaerobic respiration
(4) transport
2. Which process is a form of autotrophic nutrition?
(1) transport
(2) regulation
(3) fermentation
(4) photosynthesis
3. An iodine test of a tomato plant leaf revealed that starch was present at 5:00 p.m. on a sunny afternoon in July. When a similar leaf from the same tomato plant was tested with iodine at 6:00 a.m. the next morning, the test indicated that less starch was present. This reduction in starch content most likely occurred because starch was
(1) changed directly into proteins
(2) transported out of the leaves through the guard cells
(3) transported downward toward the roots through tubes
(4) changed into simple sugars
4. An activity carried on by every living plant and animal is
(1) photosynthesis
(2) respiration
(3) reproduction
(4) transpiration
5. In the diagram of a cell below, the structure labeled X enables the cell to



- (1) release energy
- (2) store waste products
- (3) control nuclear division
- (4) manufacture proteins

6. A structure that performs a specialized function within a cell is known as
(1) a tissue
(2) an organelle
(3) an organ
(4) a system
7. Base your answer to the following question on the diagrams below which represent two different cells.



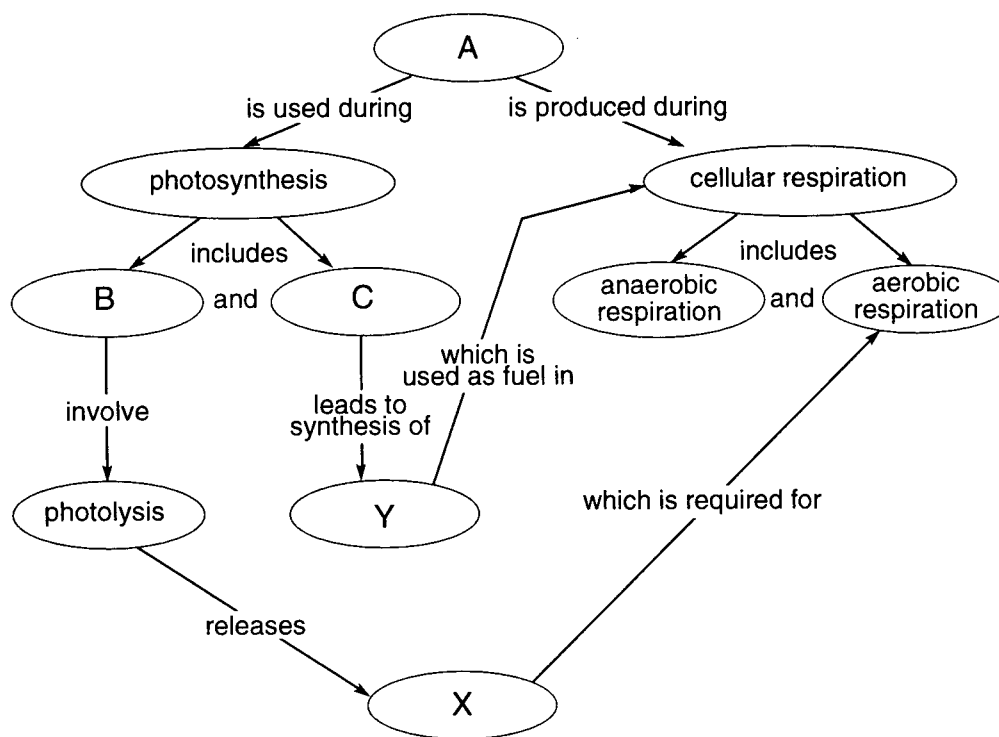
In both cells, the organelles labeled *E* are the sites of

- (1) secretion
(2) starch synthesis
(3) aerobic respiration
(4) food storage
8. Transport of molecules within animal cells is assisted by a system of internal membranes that make up the
(1) endoplasmic reticulum
(2) mitochondria
(3) ribosomes
(4) chloroplast
 9. Glucose molecules that are produced by green plants can be
(1) converted into starch by dehydration synthesis and stored in roots
(2) converted into cellulose by hydrolysis and stored in leaves
(3) used as catalysts for metabolic activity
(4) used as a raw material for photosynthesis

10. Which safety precaution is recommended when a liquid is being heated in a test tube?

- (1) When holding the test tube, keep fingers closest to the open end of the tube.
- (2) Direct the flame of the burner into the open end of the test tube.
- (3) Stopper the test tube with a rubber stopper.
- (4) Wear goggles and a laboratory apron.

11. Base your answer to the following question on the diagram below, which is a concept map that shows the relationship between photosynthesis and respiration, and on your knowledge of biology.



Which molecule belongs in area X?

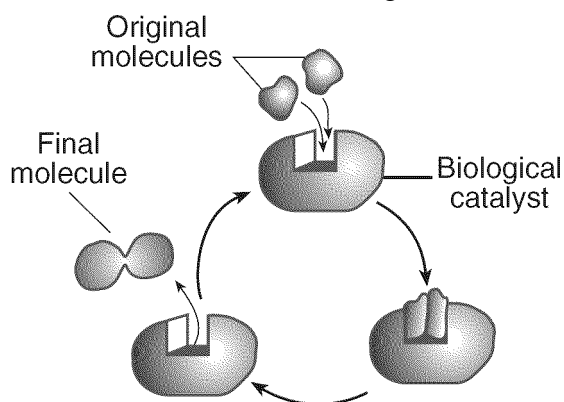
- (1) lactic acid (2) carbon dioxide (3) water (4) oxygen

12. Groups A and B in the table below contain molecular formulas of compounds.

Group A	Group B
$C_6H_{12}O_6$	NaCl
$C_{12}H_{22}O_{11}$	NH_3

How would the compounds in these groups be chemically classified?

- (1) group A - inorganic
group B - organic
 - (2) group A - organic
group B - inorganic
 - (3) group A - monosaccharides
group B - disaccharides
 - (4) group A - disaccharides
group B - monosaccharides
13. The diagram below represents a series of reactions that can occur in an organism.

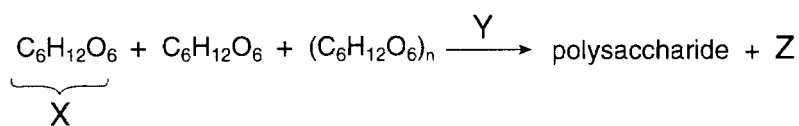


This diagram best illustrates the relationship between

- (1) enzymes and synthesis
- (2) amino acids and glucose
- (3) antigens and immunity
- (4) ribosomes and sugars

Liv Enviro Midterm Review

Base your answers to questions **14** and **15** on the chemical reaction represented below and on your knowledge of biology.



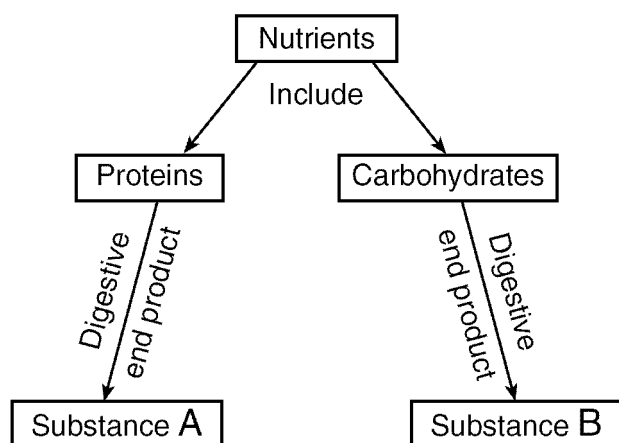
14. Letter *Y* most likely represents

- (1) a neurotransmitter (2) a hormone (3) a lipid (4) an enzyme

15. Letter *Z* most likely represents molecules of

- (1) water (2) plant hormones (3) glycogen (4) nucleic acids

16. Base your answer to the following question on the information in the diagram below and on your knowledge of biology.



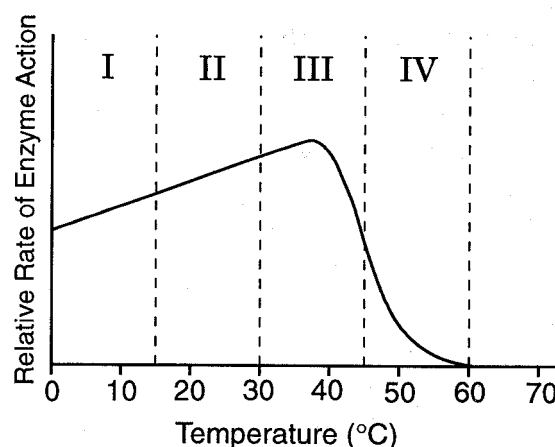
In a heterotrophic organism, substance *A* could be used directly for

- (1) photosynthesis
(2) synthesis of enzymes
(3) a building block of starch
(4) a genetic code

17. In an experiment, what should be the relationship between the control group and the experimental group?

- (1) They should be different in size
(2) They should resemble each other in at least two respects
(3) They should not be similar in any respect
(4) They should be identical in all respects except one

18. Base your answer to the following question on the graph below and on your knowledge of biology.



What is the optimum temperature for the enzyme?

- (1) 0°C (3) 55°C
(2) 37°C (4) 60°C

19. A new drug for the treatment of asthma is tested on 100 people. The people are evenly divided into two groups. One group is given the drug, and the other group is given a glucose pill. The group that is given the glucose pill serves as the

(1) experimental group (3) control
(2) limiting factor (4) indicator

20. Which sequence shows a *decreasing* level of complexity?

- (1) organs - organism - cells - tissues
(2) organism - cells - organs - tissues
(3) cells - tissues - organs - organism
(4) organism - organs - tissues - cells

21. In an investigation designed to determine the effect of the amount of water on plant growth, two groups of equal-sized bean plants of the same species were grown under identical conditions, except for the amount of water they were given. One group was watered with 200 milliliters of water once a day, while the other group was watered with 400 milliliters of water once a day. After several days, the heights of the plants were measured. It was determined that the plants watered with 400 milliliters of water once a day showed more growth.

The variable in this investigation is the

- (1) type of bean plants used in the experiment
 - (2) amount of water given the plants each day
 - (3) type of soil the bean plants were growing in
 - (4) group of bean plants watered with 200 ml of water
22. Which statement describes the best procedure to determine if a vaccine for a disease in a certain bird species is effective?
- (1) Vaccinate 100 birds and expose all 100 to the disease.
 - (2) Vaccinate 100 birds and expose only 50 of them to the disease.
 - (3) Vaccinate 50 birds, do not vaccinate 50 other birds, and expose all 100 to the disease.
 - (4) Vaccinate 50 birds, do not vaccinate 50 other birds, and expose only the vaccinated birds to the disease.
23. A student conducted an original, well-designed experiment, carefully following proper scientific procedure. In order for the conclusions to become generally accepted, the experiment must
- (1) contain several experimental variables
 - (2) be repeated to verify the reliability of the data
 - (3) support the original hypothesis
 - (4) be conducted by a scientist

24. The presence of large numbers of mitochondria in the tubule cells of nephrons suggests that the transport of materials into and out of tubule cells requires
- (1) acids
 - (2) pigments
 - (3) energy
 - (4) enzymes
25. Base your answer to the following question on the information below and on your knowledge of biology.

An experiment was designed to determine if chlorophyll is responsible for the growth of corn seedlings toward light. In the experiment, equal numbers of albino corn seedlings and green corn seedlings were grown at a temperature of 24°C. All other environmental conditions were the same for both groups of seedlings. The results of the experiment showed that both the albino seedlings and the green seedlings bent toward light.

Which sequence of steps was most likely taken in this experiment?

- (1) develop a hypothesis→select suitable laboratory materials→test the hypothesis→formulate a conclusion
 - (2) select suitable laboratory materials→formulate a conclusion→develop a hypothesis→test the hypothesis
 - (3) develop a hypothesis→test the hypothesis→select suitable laboratory materials→formulate a conclusion
 - (4) formulate a conclusion→select suitable laboratory materials → develop a hypothesis →test the hypothesis
26. The current knowledge concerning cells is the result of the investigations and observations of many scientists. The work of these scientists forms a well-accepted body of knowledge about cells. This body of knowledge is an example of a
- (1) hypothesis
 - (2) controlled experiment
 - (3) theory
 - (4) research plan

27. The total magnification of an image formed by a compound light microscope is a result of the combined magnifications of the
- (1) eyepiece and diaphragm
 - (2) objective and mirror
 - (3) eyepiece and objective
 - (4) low-power objective and high-power objective

Base your answers to questions **28** and **29** on the information below and on your knowledge of biology.

A scientist conducted an experiment to test the hypothesis that maple seeds exposed to acid rain will take longer to germinate than seeds exposed to normal rain, which has a pH of 5.6. The scientist set up four groups, each containing 200 maple seeds. The water used for each group had a different pH value: 5.6, 4.0, 3.0, and 2.0. All other conditions were kept the same. After ten days, the number of seeds that had germinated in each group was counted.

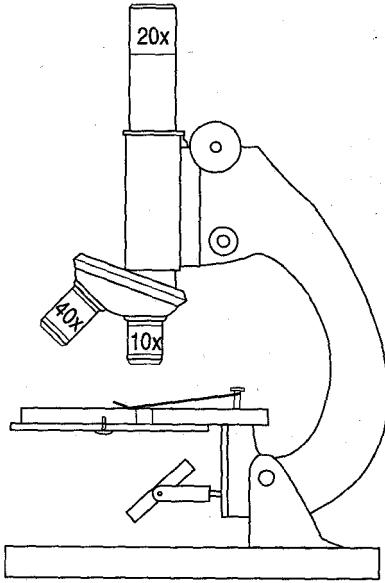
28. Identify the control group in this experiment.
29. Identify the dependent variable in this experiment.

-
30. Why do scientists consider any hypothesis valuable?
- (1) A hypothesis requires no further investigation.
 - (2) A hypothesis may lead to further investigation even if it is disproved by the experiment.
 - (3) A hypothesis requires no further investigation if it is proved by the experiment.
 - (4) A hypothesis can be used to explain a conclusion even if it is disproved by the experiment.

31. Which statement best describes a hypothesis?
- (1) A hypothesis is the process of making careful observations.
 - (2) The conclusion drawn from the results of an experiment is part of a hypothesis.
 - (3) A hypothesis serves as a basis for determining what data to collect when designing an experiment.
 - (4) The facts collected from an experiment are written in the form of a hypothesis.

-
32. Methylene blue is used in microscope studies to help in the observation of
- (1) chloroplasts of onion cells
 - (2) iron in hemoglobin
 - (3) photosynthesis in elodea
 - (4) nuclei in animal cells
33. Tendons are classified as
- | | |
|-------------------|-----------------------|
| (1) blood tissue | (3) nerve tissue |
| (2) muscle tissue | (4) connective tissue |
-

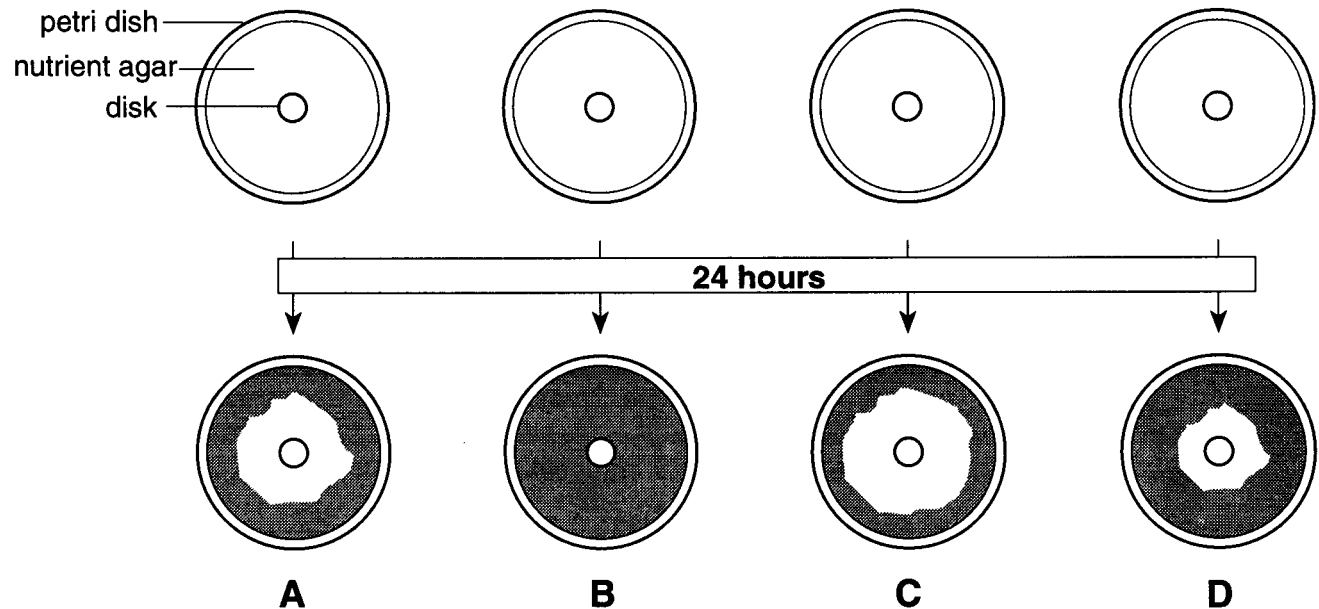
34. What is the *lowest* possible magnification that can be obtained using the microscope shown below?



- (1) 20× (3) 40×
(2) 200× (4) 800×
35. Which two structures are directly involved in locomotion in humans?
- (1) visceral muscle and fibrous tendons
(2) smooth muscle and ligaments
(3) skeletal muscle and bones
(4) cardiac muscle and immovable joints
36. An intestinal cell that secretes an enzyme would most likely contain many
- (1) ribosomes (3) chloroplasts
(2) centrioles (4) nuclei
-

37. Base your answer to the following question on the information and diagram below and on your knowledge of biology.

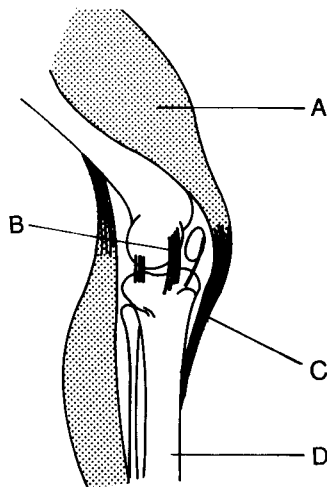
A student investigated the effectiveness of four different mouthwashes in destroying bacteria. He inoculated the nutrient agar in four petri dishes with bacteria. Each of four paper disks, 1 centimeter in diameter, was soaked in a different mouthwash sample and placed on a different agar surface. Sterile procedures were used throughout the experiment. Each petri dish was placed in an incubator at a temperature of 37°C for a 24-hour period. The diagram below represents the sequence of events in this investigation. The shaded areas in the petri dishes represent regions of bacterial growth.



Which petri dish contains the most effective mouthwash?

- (1) A (2) B (3) C (4) D

38. Which letter in the diagram below indicates a ligament?



- (1) A (3) C
(2) B (4) D

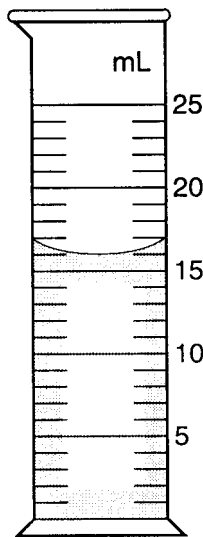
39. Microscopic examination of an animal cell reveals the presence of a plasma membrane but no cell wall. Which additional structures would normally be present within this cell?

- (1) starch grains (3) chloroplasts
(2) centrioles (4) large vacuoles

40. A cell having 26 chromosomes divides to produce two daughter cells, each having 26 chromosomes. The chromosome number of the daughter cells is due most directly to

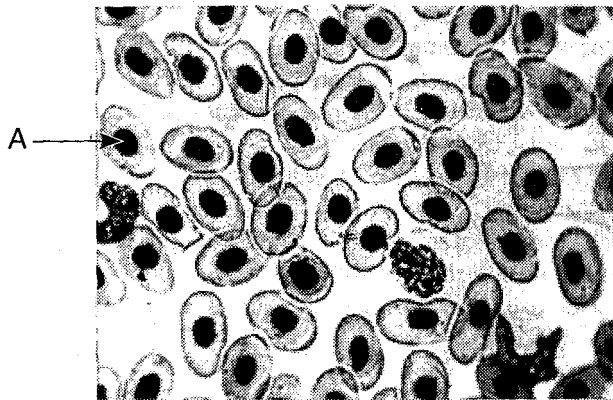
- (1) synapsis and spindle formation
(2) replication and nondisjunction of chromosomes
(3) replication and migration of single-stranded chromosomes
(4) synapsis and crossing-over

41. The diagram below represents a graduated cylinder containing a liquid.



How many milliliters of fluid should be added to the graduated cylinder to raise the volume to 21 milliliters?

- (1) 10 (3) 8
(2) 5 (4) 4
42. Base your answer to the following question on the photograph below, which shows a sample of stained frog blood cells as viewed with the high-power objective of a compound light microscope.

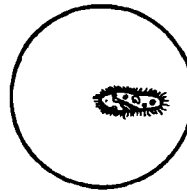


Structure A is best described as a

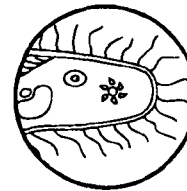
- (1) lysosome that stores hydrolytic enzymes
(2) mitochondrion that produces ATP
(3) chloroplast that carries out photosynthesis
(4) nucleus that regulates cell activity

43. The diameter of a microscope field under low power (100 \times) is 2,000 micrometers. Which diagram best shows how a paramecium 500 micrometers long would appear under high power (400 \times)?

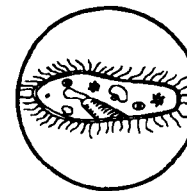
(1)



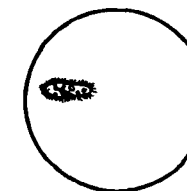
(2)



(3)



(4)

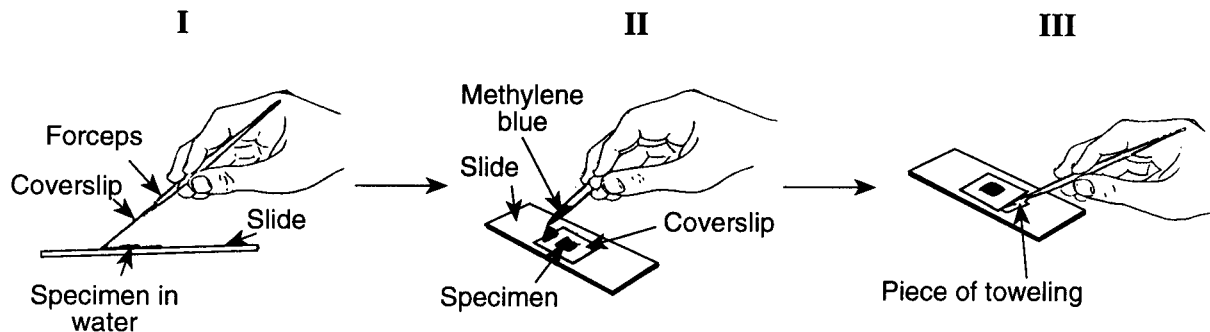


44. Which is a true statement about normal diploid cells?

- (1) They contain only one chromosome of each homologous pair.
(2) They contain only half the number of chromosomes that are in a gamete.
(3) They contain homologous pairs of chromosomes.
(4) They contain chromosomes that are all of equal length.

Liv Enviro Midterm Review

Base your answers to questions 45 and 46 on the diagram below and on your knowledge of biology.

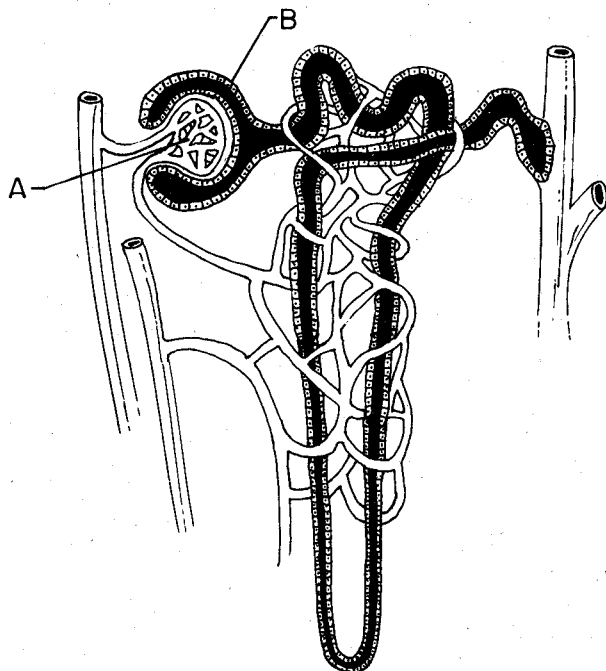


45. Which laboratory technique is illustrated in the diagram?

- (1) testing a specimen for amino acids
- (2) determining the pH of a specimen
- (3) measuring the photosynthetic rate in a specimen
- (4) preparing a wet mount of a specimen

46. Using one or more complete sentences, state a reason why methylene blue was used in the laboratory technique.

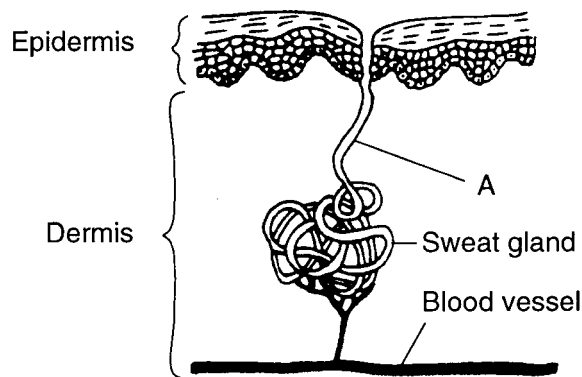
47. Base your answer to the following question on the diagram below which represents a microscopic view of a functional unit of a kidney and on your knowledge of biology.



In a kidney, which blood component would *not* usually pass through the membranes from region A to region B?

- (1) red blood cells
- (2) mineral salts
- (3) urea
- (4) water

48. The diagram below illustrates some structures of the skin



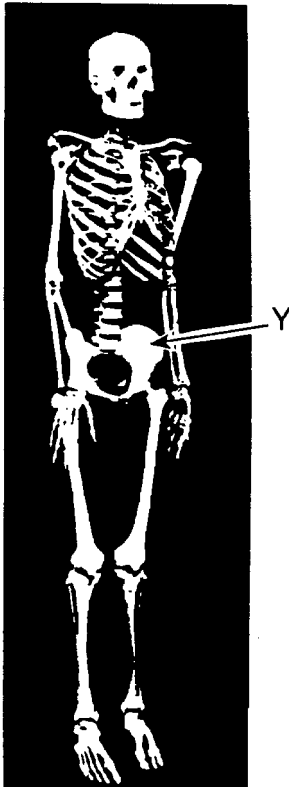
A substance that blocks structure A would directly interfere with

- (1) cellular respiration
- (2) storage of urea
- (3) dehydration synthesis
- (4) temperature regulation

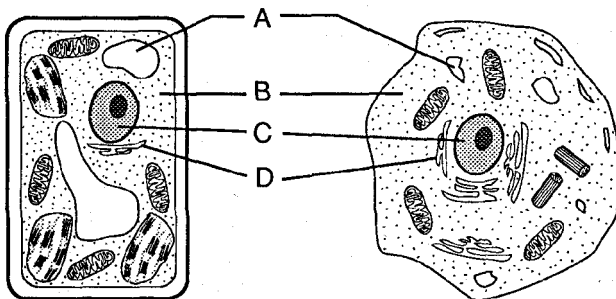
49. The ability of cells to pass on their characteristics to new cells is most directly related to the ability of

- (1) cytoplasm to excrete wastes
- (2) effectors to respond to environmental changes
- (3) ribosomes to use energy
- (4) chromosomes to replicate

50. What is a function of the structure labeled Y in the diagram below?

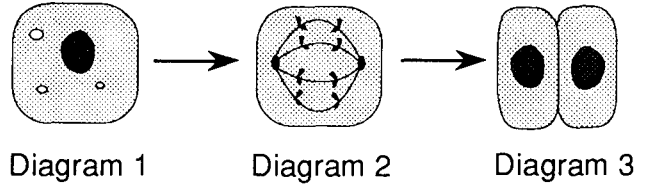


- (1) It serves as a site for the synthesis of hormones
 (2) It supports and protects body structures.
 (3) It contracts to aid in locomotion.
 (4) It provides vitamins during periods of physical stress.
51. In the diagram below, which letter indicates the cell part in which the changes involved in mitosis first become evident?



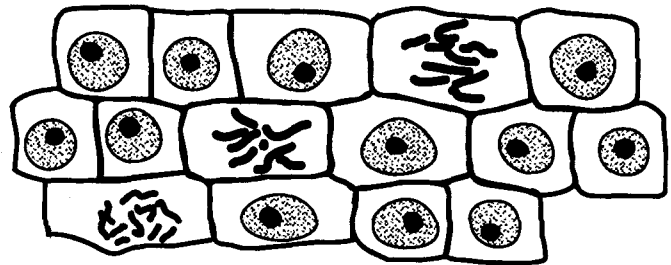
- (1) A (3) C
 (2) B (4) D

52. The diagrams below represent a cell process.



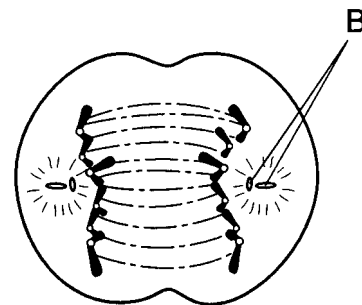
If the cell in diagram 1 contains 4 chromosomes, what is the total number of chromosomes in each cell in diagram 3?

- (1) 8 (3) 16
 (2) 2 (4) 4
53. The diagram below shows some cells in the meristematic region of a root tip.



Which statement about these cells is correct?

- (1) About 20 percent of the cells are dividing.
 (2) About 80 percent of the cells are dividing.
 (3) Most of the cells are undergoing meiosis.
 (4) Most of the cells will never undergo mitosis.
54. The cell in the diagram below illustrates a stage of mitotic cell division.



Letter B indicates the

- (1) paired chromosomes
 (2) centrioles
 (3) cell plate
 (4) endoplasmic reticulum

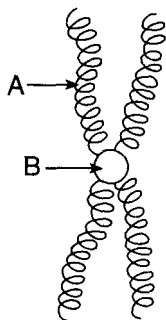
55. The phrases below describe several events that occur during the process of mitosis.

- (A) attachment of double-stranded chromosomes to the spindle apparatus
- (B) formation of single-stranded chromosomes, which are moved to opposite ends of the cell
- (C) disintegration of the nuclear membrane
- (D) nuclear membrane formation around each set of chromosomes, forming two nuclei
- (E) synthesis of a spindle apparatus

Which sequence represents the correct order of these events?

- (1) $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$
- (2) $B \rightarrow D \rightarrow A \rightarrow C \rightarrow E$
- (3) $A \rightarrow D \rightarrow E \rightarrow B \rightarrow C$
- (4) $C \rightarrow E \rightarrow A \rightarrow B \rightarrow D$

56. The diagram below represents a microscopic structure observed during cell division.



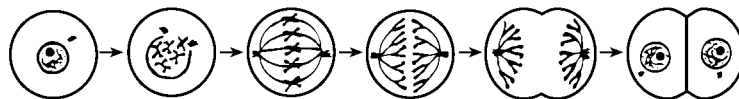
Which parts of the structure are indicated by arrows A and B, respectively?

- (1) centriole and tetrad
- (2) autosome and allele
- (3) homologous chromosome and spindle fiber
- (4) chromatid and centromere

57. Marine sponges contain a biological catalyst that blocks a certain step in the separation of chromosomes. Which cellular process would be directly affected by this catalyst?

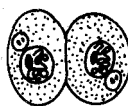
- (1) mitosis
- (2) diffusion
- (3) respiration
- (4) photosynthesis

58. Which activity most directly involves the process represented in the diagram below?



- (1) a gamete reproducing sexually
- (2) a white blood cell engulfing bacteria
- (3) a zygote being produced in an ovary
- (4) an animal repairing damaged tissue

59. Base your answer to the following question on the diagrams below.



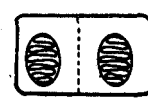
(A)



(B)



(C)

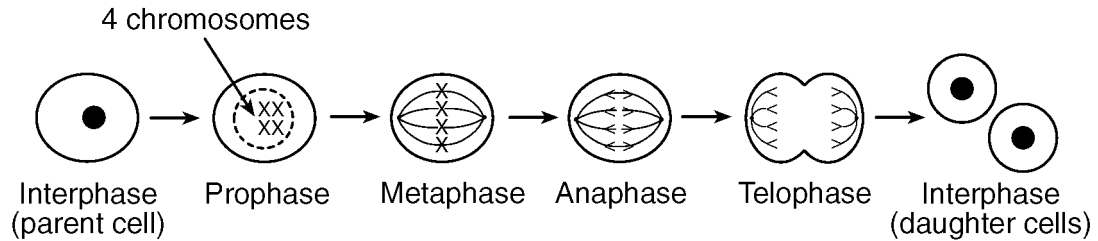


(D)

Which diagram shows the formation of a cell plate?

- (1) A
- (2) B
- (3) C
- (4) D

60. The diagram below illustrates the process of cell division.



What is the significance of anaphase in this process?

- (1) Anaphase usually ensures that each daughter cell has the same number of chromosomes as the parent cell.
- (2) Anaphase usually ensures that each daughter cell has twice as many chromosomes as the parent cell.
- (3) In anaphase, the cell splits in half.
- (4) In anaphase, the DNA is being replicated.

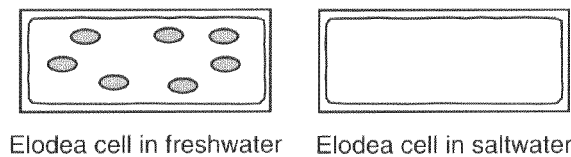
61. Base your answer to the following question on the chart below and your knowledge of biology.

In the Making Connections laboratory activity, a group of students obtained the following data:

Student Tested	Pulse Rate at Rest	Pulse Rate After Exercising
1	70	97
2	75	106
3	84	120
4	60	91
5	78	122

Explain how this change in pulse rate is associated with homeostasis in muscle cells.

62. *Elodea* is a plant that lives in freshwater. The diagram below represents one *Elodea* leaf cell in its normal freshwater environment.



Predict how the contents of the *Elodea* cell would change if the cell was placed in saltwater for several minutes by completing the diagram, "*Elodea* cell in saltwater" above. Label the location of the cell membrane.

63. Base your answer to the following question on the information below and on your knowledge of biology.

Students prepared four models of cells by using dialysis tubing containing the same blue solution. Each of the model cells originally weighed 10 grams. They then placed each model cell in a beaker containing a different concentration of water. After 24 hours, they recorded the mass of the model cells as shown in the data table below.

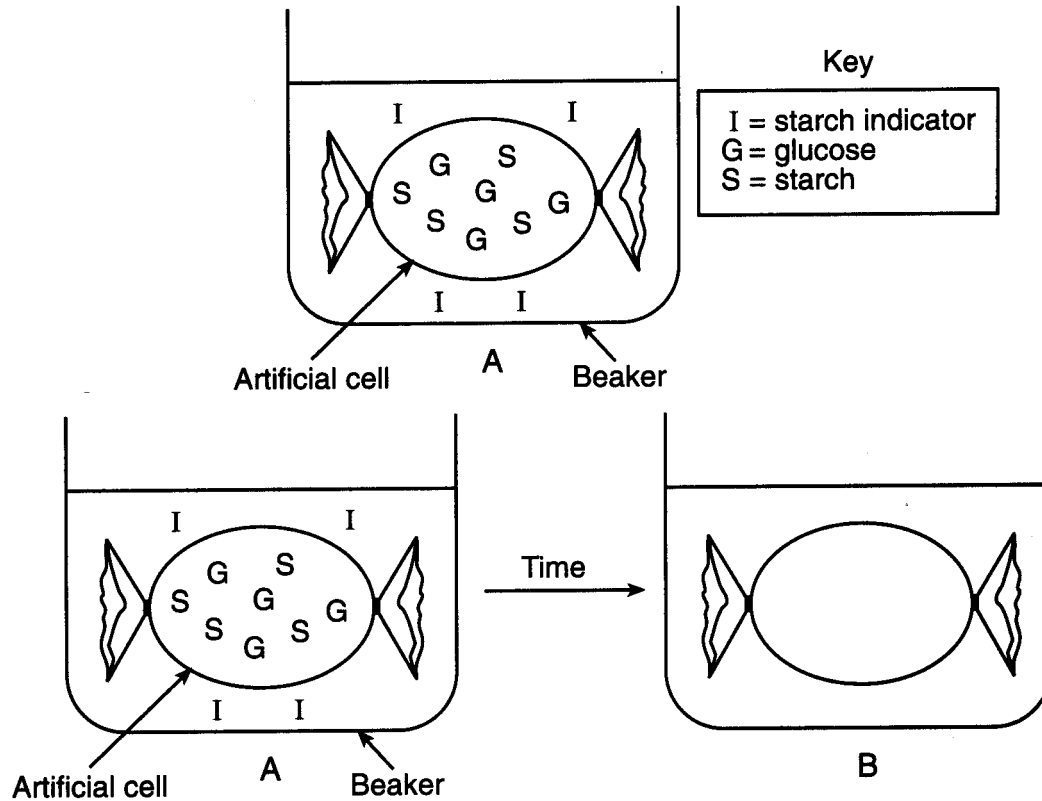
Data Table

Concentration of Water Surrounding the Model Cell	Mass of Model Cell
100%	12 grams
90%	11 grams
80%	10 grams
70%	9 grams

What was the concentration of water in the original blue solution? State evidence in support of your answer.

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Base your answers to questions **64** and **65** on the information and diagram below and on your knowledge of biology. The diagram illustrates an investigation carried out in a laboratory activity on diffusion. The beaker and the artificial cell also contain water.



64. Predict what would happen over time by showing the location of molecules *I*, *G*, and *S* in diagram *B* above.
65. State what is observed when there is a positive test for starch using the starch indicator.

Question ID's in Numerical Order.

1. 4
 2. 624
 3. 647
 4. 661
 5. 666
 6. 682
 7. 1007
 8. 1161
 9. 1163
 10. 1167
 11. 1224
 12. 1337
 13. 1588
 14. 1619
 15. 1622
 16. 1734
 17. 1740
 18. 2293
 19. 2442
 20. 2780
 21. 2864
 22. 2890
 23. 2914
 24. 3035
 25. 3213
 26. 3229
 27. 3325
 28. 3338
 29. 3427
 30. 3462
 31. 3465
 32. 3589
 33. 3590
 34. 3597
 35. 3619
 36. 3680
 37. 3681
 38. 3762
 39. 3790
 40. 3898
 41. 3950
 42. 4104
 43. 4243
 44. 4263
 45. 4475
 46. 4606
 47. 4690
 48. 4781
 49. 4851
 50. 4921
 51. 5143
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-
52. 5249
 53. 5479
 54. 5566
 55. 5593
 56. 5611
 57. 5794
 58. 5831
 59. 5928
 60. 5929
 61. 5952
 62. 6465
 63. 6788
 64. 6828
 65. 6829
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